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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,513	09/09/2003	Yuhong Wang	58970.010500	1783

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EXAMINER

GATES, ERIC ANDREW

ART UNIT	PAPER NUMBER
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3722

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/658,513	Applicant(s) WANG ET AL.	
	Examiner Eric A. Gates	Art Unit 3722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 and 24 January 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>1/24/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to Applicant's amendment filed on 22 January 2007 and Applicant's IDS filed 24 January 2007.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakihira et al. (Japanese Patent 03117507 A) in view of Imanaga et al (U.S. Patent 4,983,079).
4. Regarding claim 1, Wakihira et al. discloses a twist drill for forming holes in or through a workpiece, having a longitudinal axis around which the twist drill is rotated and in the direction of which the twist drill is advanced into the workpiece, and two transverse axes disposed perpendicular to each other and to the longitudinal axis, comprising: a shank (not shown but inherent), for enabling the twist drill to be mounted to a driving device; a body (not shown but inherent) emanating from, and coaxial with the shank, the body having a radius; at least one flute 5 extending helically along the body; at least one land (not referenced, but next to flute 5 in figure 1) disposed adjacent to the at least one flute 5; and a point structure 1/2 formed on an end of the body distal

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to the shank, the point structure being generally in the form of a brad point having an extreme tip through which the longitudinal axis of the drill passes, the point structure further having two spur structures (outer tips of cutting lip 2) on opposite sides thereof; a cutting lip 2 on a leading edge of each of the spur structures, the drill further including axial relief surfaces (not labeled, bottom surface seen below surfaces 3 and 4 in figure 2) on trailing surfaces of the lands, the axial relief surfaces being separated from the leading edges of the spur structures by one or more cutting edge surfaces 4, wherein the axial relief surfaces are disposed at a separate, substantially steeper angle, relative to a plane perpendicular to the longitudinal axis of the twist drill, than the one or more cutting edge surfaces.

Wakihira et al. does not distinctly disclose that the axial relief surfaces and cutting edge surfaces are planar, although it appears that this is the case in figure 1. Imanaga et al. teaches the use of axial relief surfaces and cutting edge surfaces that are planar for the purpose of enabling them to be resharpened by surface grinding. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the drill of Wakihira et al. with the planar surfaces of Imanaga et al. in order to have a drill that is easier to sharpen.

5. Regarding claim 2, the modified invention of Wakihira et al. discloses wherein the point 1/2 comprises a first radially outwardly disposed portion 4 of the at least one land angling inwardly and axially toward the shank, to a position between a peripheral portion of the body, and the longitudinal axis and a second, radially inwardly disposed portion 3

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of the at least one land, angling inwardly and axially away from the shank and toward the central point structure.

6. Regarding claim 3, the modified invention of Wakihiro et al. discloses the invention substantially as claimed, except Wakihiro does not disclose wherein the first radially outward disposed portion of the at least one land is defined at least in part by a leading edge angle and a trailing edge angle, wherein the leading edge angle equals $15^{\circ} \pm 10^{\circ}$ (this angle is measured at approximately 15° in figure 1) and the trailing edge angle equals $12^{\circ} \pm 7^{\circ}$ (this angle is measured at approximately 19° in figure 1). Even if it can be argued that these measured angles are not an exact representation of the required angles, as the figures are not necessarily drawn to scale, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have chosen these angles, because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

7. Regarding claim 4, the modified invention of Wakihiro et al. discloses wherein the second, radially inwardly disposed portion of the at least one land is defined at least in part by a point angle alpha and an angle which represents an axial separation between the central point structure and radially outer portions of the at least one land, wherein alpha is between 80 and 100 degrees, inclusive (alpha is disclosed as being in the range 98° to 112° ; the 98° to 100° portion falls within this range); and the axial separation angle measures approximately 147 degrees on Figure 1 (falls within the 140 to 170 degrees for this claim). Even if it can be argued that this measured angle is not

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an exact representation of the required angle, as the figures are not necessarily drawn to scale, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have chosen this angle, because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

8. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakihiro et al. in view of Crisp (U.S. Patent 2,769,355).

9. Regarding claim 5, the modified invention of Wakihiro et al. discloses the at least one flute terminating in a cutting lip disposed proximate the point; the at least one flute having a sectional configuration, in a plane perpendicular to the longitudinal axis, incorporating a leading edge, a trailing edge, a straight surface extending inwardly from the leading edge (the first portion of cutting edge 2), at least to a position coplanar with a plane passing perpendicularly through the straight surface to the longitudinal axis, and a first concave curved portion, extending from an inward end of the straight surface. Wakihiro et al. does not disclose a second concave curved portion, extending inwardly from the trailing toward an outer edge region of the first concave curved portion, and a ridge formed by the intersection of the outer edge region of the first concave curved portion and an inner edge region of the second concave curved portion. Crisp discloses a fluted drill that has a first concave curved portion 15 and a second concave curved portion 16 that intersect at a ridge 11 for the purpose of breaking up the cut chips into small pieces. Therefore it would have been obvious to one having ordinary skill in the

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art at the time the invention was made to have combined the drill of Wakihiro et al. with the concave flute portions and ridge portion of Crisp in order to have a brad type drill that makes small chips during drilling.

10. Regarding claim 6, the modified invention of Wakihiro et al. discloses the invention substantially as claimed.

11. Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wakihiro et al. and Crisp as applied to claims 5 and 6 above, and further in view of Guehring et al. (U.S Patent 6,213,692).

12. Regarding claim 7, the modified invention of Wakihiro et al. discloses the invention substantially as claimed, except Wakihiro et al. does not disclose the ridge is in the form of a rounded bump. Guehring et al. teaches the use of grooves 18 on a drill that form ridges in the shape of rounded bumps for the purpose of breaking up the cut chips into small pieces. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the modified drill of Wakihiro et al. with the rounded bumps of Guehring in order to have a brad type drill that makes small chips during drilling without having stress concentrations at the end of the ridges.

13. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakihiro et al. and Crisp, and further in view of Guehring et al. (U.S Patent 6,213,692).

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14. Regarding claims 8-11, the modified inventions of Wakihiro et al. in claims 5, 6, and 7 disclose the inventions substantially as claimed.

Response to Arguments

15. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

16. For the reasons as set forth above, the rejections are maintained.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric A. Gates whose telephone number is 571-272-5498. The examiner can normally be reached on Monday-Thursday 7:45-6:15.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Monica Carter can be reached on 571-272-4475. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



EAG

16 February 2007



MONICA CARTER
SUPERVISORY PATENT EXAMINER